# Arsenic in Well Water: Understanding Your Test Results

## What is arsenic?

Arsenic is an element that is found in soil and rock. High levels of arsenic have been found in hundreds of private drinking water wells in northeastern Wisconsin. Most of these wells are in parts of Outagamie and Winnebago counties where there is a deep soil layer of arsenic. Under certain conditions this arsenic can be released into groundwater and enter local wells. Some experts believe that drawdown of the water table is causing arsenic levels to rise in local wells. Drawdown occurs when the groundwater level is lowered as water is pumped from the ground by wells. For this reason conserving water use could reduce the likelihood of a future arsenic problem.

## How can arsenic affect my health?

Long term exposure to high levels of arsenic is known to increase risks of skin, bladder, lung, liver, colon, and kidney cancer. Other health effects may include blood vessel damage, high blood pressure, nerve damage, anemia, stomach upsets, diabetes, and skin changes. Consult your physician if you have any health problems that you think may be caused by arsenic exposure.

Your health risks are determined by the following factors:

- the concentration of arsenic in your water,
- the amount of water you drink each day,
- the length of time you drink the water, and
- your individual sensitivity to arsenic.

## Where is the arsenic level on my lab slip?

Lab slips vary between labs but the basic layout remains the same. The concentration of arsenic in your sample is reported under RESULTS. The UNITS, typically ug/l (micrograms per liter) or ppb (parts per billion) represent the concentration. Micrograms per liter (ug/l) or ppb represent the same amount, and are used interchangeably. The 'less than' symbol ( < ) means the amount of arsenic in your water sample is lower than what the lab can detect. Contact the lab directly if you have questions about your lab reports.
You can find a laboratory in the yellow pages of your phone book. Ask to make sure the lab is certified to test for arsenic.

## What level of arsenic is safe?

The federal drinking water standard for arsenic in public water supplies was recently lowered from 50 ppb to 10 ppb. It is recommended that people stop using their water for drinking or food preparation if arsenic is found above 10 ppb. Because your well doesn't serve the public, there are no state or federal requirements that you stop using your water, regardless of the arsenic level. Whether or not to continue using your water is a personal decision that you will make based on the health risks and other factors such as cost and convenience. The following table provides a general guide for the average person.

| | |
|---|---|
| **Below 10 parts per billion (ppb)** | Unless you drink more than a half gallon of water a day there is little health benefit to changing your water use at this level. |
| **10 parts per billion (ppb) or greater** | Do not drink or use well water to prepare foods that require a lot of water (e.g. infant formula, soups, Jell-O, rice, coffee, tea) if arsenic levels are above 10 ppb. Washing foods and dishes in the water is safe, and is not a significant source of exposure. |

***Because levels can change over time, annual testing is recommended.**

## What about bathing/showering or other uses?

Unless your arsenic level is over 500 ppb, showering, bathing, and other household uses are safe. Arsenic is not easily absorbed through intact skin and does not evaporate into the air.

## How can I reduce my exposure to arsenic?

There are a number of ways that you can reduce your exposure to arsenic. Each of these methods has advantages and disadvantages, but all are intended to provide your family with a safe water supply.

| **Bottled Water** | |
|---|---|
| ***Advantages*** | ***Disadvantages*** |
| • Relatively inexpensive | • Inconvenient<br>• Ongoing cost of about $200-$300/year |
| **Point of Use (POU) treatment devices:** Reverse Osmosis (R/O) and Distillation | These are products used at the tap. |
| ***Advantages*** | ***Disadvantages*** |
| • More convenient than bottled water.<br>• Relatively inexpensive<br>• Average cost for reverse osmosis system is $500-$1200 + pretreatment devices<br>• Average cost for distillation system is $800-$2000 | • Only the kitchen tap water is treated<br>• Regular maintenance and testing is needed<br>• May not remove enough arsenic if well test is above 300 ppb<br>• Reverse osmosis units tend to waste a lot of water. |
| **Point of Entry (POE) treatment systems** | These are systems that treat the water coming into the house. |
| ***Advantages*** | ***Disadvantages*** |
| • Safe drinking water is available at every tap. | • Moderately expensive. Average cost is $1500-$7000.<br>• Requires regular maintenance and testing. |
| **Well Repair, Well Construction** | Drill a deeper well and put casing past the arsenic zone. Make sure the well driller obtains and follows the special well construction recommendations provided by the DNR. |
| ***Advantages*** | ***Disadvantages*** |
| • Usually provides a permanent solution. 90% of new wells have tested low in arsenic. | • There is no guarantee that a new well will be arsenic-free. Some new wells initially produce water low in arsenic, but the arsenic level can increase over time.<br>• Expensive. Cost can be more than $10,000. |
| **Public water supply or community well** | |
| ***Advantages*** | ***Disadvantages*** |
| • Provides a permanent safe water supply.<br>• Cost is shared by many families | • Public water may not be nearby.<br>• Annexation may be required.<br>• Shared wells require continued cooperation between neighbors. |

## WI Dept of Commerce: Approved Water Treatment Devices for Arsenic

(as of December 10, 2001)

## Point of Use (POU): Reverse Osmosis Systems

| Manufacturer | Model Numbers | Manufacturer | Model Numbers |
|---|---|---|---|
| EcoWater Systems<br>Margaret Bicking<br>P.O. Box 64420<br>St. Paul MN 55164<br>651-731-7409 | ERO B524 | R&M Manufacturing<br>Rick Miller<br>28 South 1550 West<br>Lindon UT 84042<br>(801) 785-5557 | Premier |
| Hellenbrand Water Conditioners<br>Paul Hellenbrand<br>404 Moravian Valley Rd.<br>P.O. Box 187<br>Waunakee WI 53597<br>(608) 849-3050 | MRO-35 | WaterCare<br>Bill Grainger<br>P.O. Box 1717<br>825 E. Albert Dr.<br>Manitowoc WI 54221<br>(920) 682-6823 | RO35 |
| Marlo Incorporated<br>Bob Hart<br>2227 South St.<br>P.O. Box 044170<br>Racine WI 53404<br>(262) 681-1300 | RO 25T, TFC 25 and TFC 25M | Water Right<br>Kurtt Gruett<br>1900 Prospect Ct.<br>Appleton WI 54915<br>(920) 739-9401 | WRO-35 |
| Microline<br>Loretta Trapp<br>P.O. Box 560<br>Windsor WI 53598<br>(608) 846-3010 | T.F.C.-4, T.F.C.-4X, Advantapure ATRO-4,T.F.C.-3 and CRO | Ionics Incorporated<br>Consumer Water Division<br>P.O. Box 560<br>Canonsburg PA 15317 | Ion-reverse osmosis |
| Kinetico Incorporated<br>Shari Genske<br>10845 Kinsman Rd.<br>P.O. Box 193<br>Newbury, OH 44065<br>(440) 564-9111 | K2, TF membrane with VX postfilter and TF membrane with GX postfilter | | |

## Point of Use (POU): Distillation Systems

| Manufacturer | Model Numbers | Manufacturer | Model Numbers |
|---|---|---|---|
| Durastill Inc.<br>David Billiard<br>4200 Birmingham Road<br>Kansas City MO 64117<br>(816) 454-5260 | 30H, 30J, 3020, 3040, 3040U, 46A, 46C, 4620, 4640, 4640U and 4696 | InnoWave<br>Tyler Adam<br>10250 Regency Circle,<br>Suite 110<br>Omaha NE 68114-3735<br>(800) 288-1891 | InnoWave 240 |

## Point of Entry (POE): Treatment Systems

| Manufacturer | Model Numbers | Manufacturer | Model Numbers |
|---|---|---|---|
| Aquatic Treatment Systems, Inc.<br>Timothy Badger<br>50 Cole Parkway<br>Scituate MA 02066<br>(781) 545-8588<br>(ion exchange) | AS/1200 | Hellenbrand Water Conditioners<br>Jill McDonald<br>404 Moravian Valley Rd.<br>P.O. Box 187<br>Waunakee WI 53597<br>(608) 849-3050<br>(iron coprecipitation) | WM-2<br>AC-12* |

**NOTE**: All consumers are encouraged to obtain a copy of the state of Wisconsin approval letter for the specific water treatment device model they are interested in. Copies of approval letters are normally

available free from charge from the manufacturer. The Department of Commerce can also provide a copy, however there is a $20.00 fee.
* Not fully reviewed or approved. Not available for residential sale or installation in Wisconsin, except for those installations agreed upon by the Dept of Commerce as part of the ongoing arsenic field study.

## What is Wisconsin doing about the arsenic in drinking water?

Because high arsenic levels occur naturally in some parts of Wisconsin, state and local agencies are investigating the health effects and possible solutions to the problem. The Department of Natural Resources (DNR) is working with researchers and well drillers to identify drilling methods that will reduce the chance of having arsenic contaminated water. The Department of Health and Family Services (DHFS) is conducting a health study to improve our understanding of the health effects of drinking well water that has arsenic in it. The Department of Commerce is working with water treatment companies to identify the best treatment option for water systems.

**For information about this problem**

Northeast Region DNR Headquarters
P.O. Box 10448
Green Bay, WI 54307
Contact: Gary Paplham
Phone: 920-448-5132

Outagamie County Health Department
401 South Elm Street
Appleton, WI 54911
Contact: Jeff Phillips
Phone: 920-832-5100
Email: phillijj@co.outagamie.wi.us

Winnebago County Health Department
PO Box 68
Winnebago, WI 54985-0068
Contact: Sue Huelsbeck
Phone: 920-232-3000
Email: shuelsbeck@co.winnebago.wi.us

**For information about health effects**

Wisconsin Division of Public Health
1 W Wilson St, Rm 150
Madison, WI 53701
Contact: Mark Werner, Toxicologist
608-266-7480
Email: wernema@dhfs.state.wi.us
or Lynda Knobeloch, Sr. Toxicologist
608-266-0923
Email: knobelm@dhfs.state.wi.us

**For information about treatment options**

Wisconsin Department of Commerce
201 W. Washington Avenue
P.O. Box 7162
Madison, WI 53707
Contact: Glen Schlueter,
Phone: 608-267-1401
Email: gschlueter@commerce.state.wi.us

Wisconsin Department of Health and Family Services
Bureau of Environmental Health
Through funds provided by:
Agency for Toxic Substances and Disease Registry PPH 45012 (Revised 12/2001)